(19) JAPANESE PATENT OFFICE
(12) PATENT JOURNAL (A)
(11) KOKAI PATENT NO. SHO 60[1985]-157889

(51) Int. Cl.[4]: B41J 17/04
17/30

Sequence Nos. for Office Use: 7513-2C
7513-2C

(21) Application No.: SHO 59[1984]-14116

(22) Application Date: January 27, 1984

(43) Publication Date: August 19, 1985

No. of Inventions: 1 (Total of 3 pages)

Examination Request: Not requested

(54) Title: TRANSFER PRINTER

(72) Inventor: Tetsuo Watanabe
Ricoh K.K.
1-3-6 Nakamagome
Ota-ku, Tokyo

(71) Applicant: Ricoh K.K.
1-3-6 Nakamagome
Ota-ku, Tokyo

[There are no amendments to this patent application.]

Agent: Kiyoshi Torii, patent attorney

* * *

Detailed explanation of the invention

Technological field

The present invention concerns a transfer printer for the selective transfer recording of an ink retained on a thin substrate, on a recording medium such as paper, etc.

Conventional technology

In transfer printers, e.g., thermal transfer printers, a thermally fusible or thermally sublimable ink is retained on a film base to form an ink sheet, which is overlaid with a recording medium such as paper, and transported together. The ink sheet and paper are held under pressure between a recording head such as a thermal head and platen, and with partial heating by the thermal head, ink in the ink sheet is selectively transferred to the paper to record picture images, characters, etc., on the paper.

However, in the transfer printers described above, during transport, the ink sheet may be easily wrinkled, and the wrinkles cause defects such as a missed [transfer of the] print. Such wrinkles are caused due to variation in the tension of the ink sheet. With such variation, in the thermal transfer printers, shrinkage of the ink sheet occurs when it is heated for transfer. In this type of conventional transfer printer, it is difficult to prevent wrinkle formation.

Objective

The present invention is to overcome such problems; it is an objective of the present invention to prevent ink-sheet wrinkle formation simply and assuredly to obtain high-quality transfer images free of defects such as a missed [transfer of the] print.

Constitution

The constitution of the transfer printer of the present invention is characterized in that, in a transfer printer carrying out recording on a recording medium by feeding an overlay of an ink sheet and recording medium and selective transfer of the ink from the ink sheet to the recording medium by a recording head, a roll that makes contact with the ink sheet and rotates in a direction to impart a longitudinal tension to the ink sheet is installed, with a portion of the roll contacting the ink sheet having a spiral form running from the middle part of the ink sheet toward the outer edges.

Next, a preferred example of the present invention is explained with figures.

In the figures, identical parts are represented by identical symbols.

Figure 1 illustrates an example of a transfer printer by the present invention.

In the transfer printer shown in the figure, the ink in the ink sheet (20) is heated for transfer onto a recording medium such as paper (10). The recording head used is a thermal head

(40). The paper (10) is fed as an overlay with ink sheet (20) and pressed between the platen (30) and thermal head (40). While in this state, partial heating occurs by the thermal head (40), and the ink in the ink sheet (20) is selectively transferred onto paper (10) to record characters or picture images on paper (10).

Thermally fusible or thermally sublimable ink is retained on, e.g., a polyester film base to obtain ink sheet (20) having a width that is the same width or is slightly wider than paper (10). This ink sheet (20) is guided by the guide rolls (50, 52) and passed between the platen (30) and thermal head (40). Before and after the head (40), the ink sheet (20) is moved in contact with wrinkle [-removing] stretching rolls (60, 60).

The rolls (60, 60) operated by the roll operating motor (62) and belts (64, 66) rotate in contact with the ink sheet (20), imparting longitudinal tension to the ink sheet (20). In the example illustrated, the roll (60) before the head (40) rotates in a direction opposite to the moving direction of the ink sheet (20), while the roll (60) after the head (40) rotates in the same direction as the moving direction of the ink sheet (20). Each of the rolls (60, 60) has a peripheral speed faster than the moving speed of the ink sheet (20), imparting a sliding friction force to the ink sheet (20). As a result, longitudinal tension is imparted to the ink sheet (20) between the rolls (60, 60) and head (40).

As shown in Figures 2(a)(b)(c), the roll (60) has a spiral form running in a swirling manner from the center of the ink sheet (20) toward the outer edges in the contact area (70) with the ink sheet (20). As the roll (60) rotates, the spiral contact area (70) spreads the ink sheet (20) in the width direction. In this case, at least the spiral contact area (70) of the roll (60) is made of a material having a certain friction coefficient with respect to the ink sheet (20), so that a certain tension is imparted to stretch the ink sheet (20) in the width direction. As a result, e.g., even when there is slack in the ink sheet (20), due to the unwinding momentum of the ink sheet (20), such slack can be readily absorbed by stretching in the longitudinal and transverse directions by the roll (60). Thus, wrinkles in the ink sheet (20), in at least the portion held between the platen (30) and head (40), are assuredly prevented, and high-quality transfer images can be obtained without missed transfer of the point.

As shown in Figures 2(a)(b)(c), the spiral contact area (70) of the roll (60) is formed at a certain distance from the center of roll (60) toward [with respect to] the two ends. In this case, the swirling directions of the spiral contact areas (70) formed on the two sides are opposite to each other. For example, the contact area (70) may be the undulation (70a) formed by spiral cutting (70a) shown in figure (a), stripe-type roughened [checkered] surface area (70b) shown in figure (b), and flocked-hair-type stripe (70c) as shown in figure (c).

Wrinkle prevention effects can also be realized by placing the roll (60) before or after the recording area by thermal head (40). The roll (60) produces similar effects even when used in printers other than transfer printers, such as electric or impact-type printers.

Effects

As described above, in the transfer printer of the present invention, wrinkle formation in the ink sheet is prevented simply and assuredly, and high-quality transfer images are obtained without defects such as missed transfer [of the print], etc.

Brief explanation of the figures

Figure 1 is a diagram illustrating an example of the transfer printer of the present invention. Figures 2(a)(b)(c) are diagonal views illustrating examples of the roll used in key parts of the printer described above.

10	paper
20	ink sheet
30	platen
40	thermal head
50,52	guide rolls
60	wrinkle prevention roll
62	roll operating motor
64,66	operating belts
70	spiral contact area
70a	undulation by cutting
70b	roughened surface area
70c	flocked-hair-type part

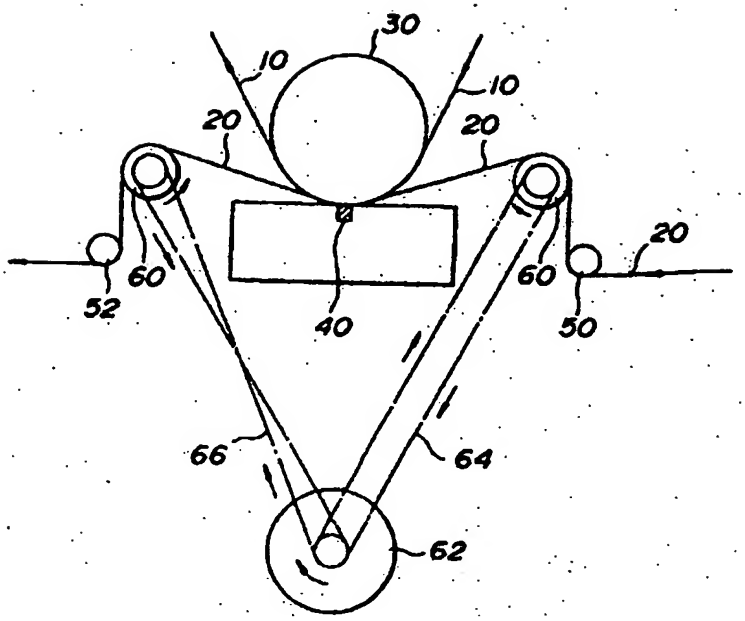

Figure 1

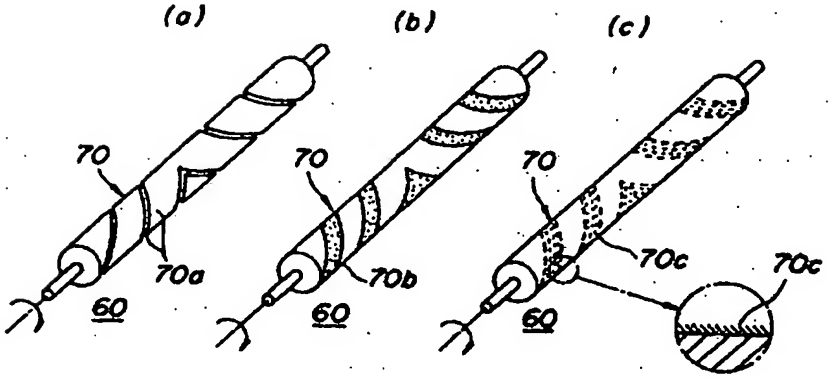

Figure 2